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Personality correlates of creativity

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PERSONALITY CORRELATES OF
CREATIVITY

A Thesis
Presented to
the Faculty of the Department of Psychology
The University of the Pacific

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
David Howard Schroeder
May 1965

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Dated May 13, 1965

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CHAPTER

INTRODUCTION

Creativity has long been considered an important characteristic of those individuals who excel in fields such as the arts and sciences. With today's increased demand for new and more products from these fields, the search for creative talent has become of prime importance. Although this "creative revolution" has been developing for a number of years, it is only recently that psychologists have begun to apply their techniques in an effort to scientifically investigate this process with the hope of being able to predict potential creativity in certain people. As late as 1950, Guilford, in his Presidential Address to the American Psychological Association, expressed concern over the apparent avoidance of this subject on the part of his fellow psychologists, and advanced some hypotheses concerning possible procedures for future investigators.

Since that time the number of psychological studies of creativity has significantly increased and investigators have explored widely divergent paths in an attempt to define the concept of creativity and make it useful in applied situations. Golann (1963), in a recent review of the literature, suggests that research in creativity has been

addressed to four major areas: the products or end result of creativity, the creative process itself, the way in which creativity is measured, and the characteristics of creative personalities.

Studies involving the products and process of creativity have generally been of the post-hoc type. After products are judged creative the term can be applied to the behavior and the individual who produced them (Gamble, 1959). The emphasis on the process of creativity is then primarily a theoretical-philosophical approach. Creative people are either observed or are asked to submit self reports in an attempt to describe the steps necessary for creative production. Since in both of these methods one must wait until a person has proved himself creative to be judged and studied as such, these methods, while not valueless, have little use in predicting potential creativity.

Measurement of Creativity

The remaining two approaches to the study of creativity, through measurement techniques and personality, have been chosen as the basis of this experiment because of their applicability to empirical testing procedures and because of their possible practical application in the prediction of creative talent. The first of these, the way in which creativity is measured, for the most part, results from the

work of Guilford and his associates (Guilford, Kettner, and Christensen, 1959). Proceeding on the assumption that creativity can be viewed productively as a trait within the entire structure of the intellect, Guilford factor analyzed some 47 known intellectual factors and isolated certain factorial aptitude traits which he felt were related to creativity. These traits are described as: the ability to see problems, fluency of thinking (the factors of word fluency and ideational fluency), flexibility of thinking (the factors of spontaneous flexibility and adaptive flexibility), originality, redefinition, and elaboration. To measure these cognitive abilities, Guilford devised or adapted a number of tests. Two of these, the Unusual Uses and Consequences tests, which have factorial loadings on ability to see problems, ideational fluency, spontaneous flexibility, and originality, have been used as the criteria of creativity in a number of publications.

Barron (1963), using multiple criteria of creativity, found that the Unusual Uses and Consequences tests correlated the highest with the combined score of the total test battery. To provide further validation of these criteria, each test score was correlated with ratings of originality. The Unusual Uses and Consequences tests showed significant correlations of .30 and .36, respectively. Using ideational fluency and adaptive flexibility (which have significant

loadings for the Unusual Uses and Consequences tests) as the criteria of creativity, Guilford (1956) reported correlations of .37 and .31, respectively, between his test criteria and a criterion of engineering performance based on pay increases. In a more practical situation, Chroness (1956) found that the Guilford test battery predicted United States Air Force student instructor grades better than an intelligence index which had been previously used.

More recent studies have also supported these results. Jones (1964) found that the Consequences test was one of the predictors of industrial science creativity. The practical criteria of creativity in this instance were ratings by 25 managerial personnel of each subject on originality, level of energy, liking for problems, technical competence, and idea mindedness. In still another setting, Cline, Richards, and Needham (1963) report that a battery of creativity tests, including Unusual Uses and Consequences, had considerable validity in predicting grade point averages in high school science courses, percentile rank on a science achievement test, teacher rating of overall science potential, and a measure of involvement in science.

While the foregoing results cannot be denied, a recurrent question in the evaluation of such studies has been: Could not the same results have been obtained using the more commonly accepted criterion of measured

intelligence? This question has been the focus of a number of studies which sought to determine the relation between intelligence and creativity. Getzels and Jackson (1959) found that high creative subjects achieved academically as well as high intelligence subjects even though there appeared to be low correlations between their criteria. Similarly, summarizing several studies, Barron (1961) suggested that a small correlation (about .40) exists between the total ranges of creativity and intelligence. However, beyond an IQ of about 120, measured intelligence is unimportant for creativity. The same contention is suggested by Meier and Stein (1955) who conclude that IQ beyond the ninety-fifth percentile is not significant for creative work. An even greater difference is reported by MacKinnon (1962) who found an essentially zero relationship between intelligence and creativity using the Terman Concept Mastery Test and ratings of creativity. The results of these and other studies would seem to indicate that creativity and intelligence are relatively separate traits, especially at the upper levels of both.

The Creative Personality

Returning to the framework provided by Golann (1963), the final approach to the study of creativity to be considered in this paper is that of viewing creativity as being

related to certain non-aptitude personality variables.

Torrance (1962) suggests that personality is not only important in the description of creativity but that it is also important in actual creative achievement. This contention is also supported by Barron (1961) when he says that beyond a certain point motivational and stylistic variables account for a great deal of creative production. To investigate this hypothesis, experimentors have tended to contrast criterion groups on either self-descriptions, others' descriptions, test performance, life history material, or work habits. The criterion groups have been selected on the basis of either ratings of creativity, performance on Guilford tests, scores on the Welsh Figure Preference Test, or nomination of individuals of outstanding creativity by a panel of experts in the field (Golann, 1963).

Guilford and his associates (Guilford, Christensen, Frick, and Merrifield, 1957) have found a large number of low but significant correlations between non-aptitude traits and measures of originality. Those people having high originality scores tend to be more interested in aesthetic expression, in reflective thinking, appear to have more tolerance of ambiguity, and to feel less need for discipline and orderliness. This same need for "disorder" is reported by Barron (1963). In another study, using the Guilford battery, Barron (1963) found that creative subjects are more

independent of group pressure than are low creative subjects. Again, under different conditions of the same study, Barron reports that when subjects with high originality scores and low Concept Mastery scores were compared with subjects having high Concept Mastery scores and low originality scores it was found that the high originality group was more affected, aggressive, dependent, dominant, forceful, impatient, outspoken, sarcastic, strong, and suggestible.

Using different criteria of creativity, Torrance (1962) found that subjects judged on the originality of their ideas scored higher on measures of achievement, affiliation, conjunctivity, ego, energy, exhibition, reflectiveness, and understanding. Crutchfield (1961) characterized the creative person as being free from excessive impulse control, that he achieves via independence rather than conformity, is individualistic, and has strong, sustained, intrinsic motivation in his field of work. Also in agreement with some of the above results is MacKinnon (1962) who reports that creative persons describe themselves as inventive, determined, independent, individualistic, enthusiastic, and industrious.

The apparent agreement among findings of these various investigators suggests the possibility that certain personality characteristics, which may be important to creativity, are independent of the specific criteria of creativity. The

suggestion is that the different tests of creativity select subjects of similar personalities or that the same people are creative regardless of the demands of the creative situation, which is the contention of Barron (1963). If this assumption is correct one should be able to select a single personality assessment technique, identify creative subjects by means of different criteria of creativity, and find that when the creative subjects are compared on the personality instrument they exhibit similar profiles.

To test the above assumption it was decided that the Edwards Personal Preference Schedule (EPPS) would be a worthwhile personality instrument because several of its fifteen manifest need scales seemed to correspond to the traits which were described in the foregoing personality descriptions. In this way comparisons could not only be made between the subjects of the present experiment but also with the results of other investigators. The specific scales which it was felt would correspond to previous results are: order, aggression, dominance, succorance, deference (dependence), achievement, affiliation, exhibition, intraception (reflectiveness), and autonomy (independence).

Although the EPPS was not used in any of the previously cited studies as the criterion for personality assessment, several other investigators have used it in this

capacity with results that should be noted before an hypothesis is advanced. Palm (1959) compared EPIS profiles of creative counsellors with the profiles of other counsellors who had scored high on the Miller Analogies. It was found that the creative counsellors demonstrated higher needs for deference, exhibition, succorance, abasement, and change. In another study, using an adjective check list based on the EPIS, McDermid (1965) found that engineers who were regarded as creative by their peers and supervisors rated themselves high on autonomy, aggression, and dominance, and low on deference and abasement.

While both of the foregoing studies could be placed within the framework of previous work, they offer quite different profiles of the creative personality, which are even in direct contradiction on two of the scales (abasement and deference). This would seem to suggest that either the criteria of creativity in counselling and engineering select quite different people or that the adjective check list used by McDermid has little correlation with the EPIS. As a partial answer to this question, a pilot study which was carried out in connection with the present study found that when high and low creative subjects were selected by the Unusual Uses and Consequences tests the high creative subjects had higher needs for succorance and endurance and lower needs for exhibition, affiliation, and

nurturance on the EPIS.

Since the above study compared subjects on the EPIS, as did Palm, and the resulting need profile was quite different from that obtained by Palm, it suggests the strong probability that those persons judged as being creative are not independent of the selection criteria as had been previously hypothesized by Barron (1963). Rather, it suggests that different criteria of creativity select quite different subjects with the accompanying different personality patterns.

This same hypothesis is also suggested by Thorndike (1963) when he stated that the correlations among the different creativity tests appear to be quite low and that the identification of creative subjects will depend very heavily upon the particular collection of subtests employed to measure creativity. Although not stated as such, Torrance (1962) gives evidence of the same problem when, in a review of the literature, he compiled a list of 84 personality characteristics which were supposed to differentiate highly creative persons from less creative ones. As found in studies involving the EPIS, many of the characteristics were in direct opposition to each other.

Purpose of the Present Study

The purpose of the present study is two-fold: (1) to

investigate the extent to which changing criteria of creativity influences the selection of subjects with different personality characteristics; and (2) to determine if the selection of different subjects by different criteria of creativity also extends to the different scoring methods which can be applied to the same test of creativity.

The specific hypotheses to be tested in this study are:

1. There will be low or non-significant correlations both between the two specific tests of creativity and between the various methods of scoring each test.
2. The subjects selected by the various methods will exhibit different personality patterns as demonstrated by their composite need profiles on the Edwards Personal Preference Schedule.

CHAPTER II

METHOD

To test the hypotheses, two tests of creativity, Unusual Uses and Consequences, were scored in three ways and the resulting six criteria were intercorrelated. As an added procedure to enhance the correlational findings, high and low creative subjects selected by each of the six scoring methods were compared by their composite need profiles on the Edwards Personal Preference Schedule.

Subjects

The subjects were 52 volunteer students from the General Psychology class at the University of the Pacific. They had volunteered with the understanding that participation in an experiment was considered partial fulfillment of the requirements for the course. There were 16 males and 36 females in the group. The mean age of the subjects was 19.4 years and they had completed an average of 2.1 years of college.

Creativity Measures

High and low creativity was determined through the use of the Unusual Uses and Consequences tests, as described by Guilford (1957). The Unusual Uses test, as used in this experiment, required each subject to list as many possible

uses as he could think of for a brick. The Consequences test required each subject to list all the possible consequences of the discovery of a layer of gold which surrounds the earth at a depth which, previously, miners had been unable to reach. Both tests were untimed to allow the subjects as much time as they desired to think about each question.

Personality Profiles

Personality profiles were obtained by administering the Edwards Personal Preference Schedule to all subjects. The EPSS yields scores on 15 scales of "manifest needs," such as achievement, intraception, dominance, abatement, and aggression. Subjects must choose between two statements of personal needs in a forced choice situation. The statements are varied as to the degree and type of needs exhibited to control for "social desirability" and to give a profile in which needs can be seen as a hierarchy of personal preferences. Standardization data are available for college and adult populations (Edwards, 1954).

Procedure

Administration of tests. Subjects were asked to report to a testing room at their own convenience with the only stipulation being that they make an appointment in advance of their appearance. Upon arrival, each subject

was given two sheets of paper, one containing the Unusual Uses question and the other containing the Consequences question. The order of the questions was systematically alternated to control for a possible transfer effect.

Subjects were told that they were free to leave whenever they felt that they had answered both questions to their own satisfaction. Upon completion of the task, appointments were made for subjects to return and complete the EHS.

Scoring. Creativity was determined by scoring each of the creativity tests in three ways: (1) for quantity; (2) for quality; and (3) a combination score. Each subject was, first, assigned a score based on the total number of his responses, omitting only obviously repeated items. The quality score was obtained by having three judges rate each response on a scale from zero to seven. The score for each subject was the total of the mean ratings assigned to each of his responses.

Zero, rather than one was taken as the lowest possible score in hope of separating low creative responses from those of a bizarre and singularly uncreative nature. To avoid personal bias, the judges were not shown the original response sheets but were given, instead, a list comprised of all the possible responses submitted by the subjects. In

this list, duplicates were omitted and responses were not seen in relation to each other. Since the definition of creativity is still in dispute, it was decided to allow each judge to apply his own definition in rating the responses and to accept the mean rating of each response as an operational determinant. To provide a measure of consistency of definition, correlations were run between judges' ratings.

The combination score was obtained by adding the quality and quantity scores. Although it was assumed that the correlations would logically be higher between each of the tests and the combination score than between each other, it was still felt that a different creative personality would be obtained with this criterion than with either test separately.

Since these three scoring methods were applied to both the Unusual Uses and Consequences tests the procedure resulted in six separate criteria of creativity. As a further comparison, the combination scores from both tests were combined again to form a Total creativity score. The resulting seven criteria were intercorrelated to ascertain the degree and significance of relationships between the tests of creativity and among the scoring procedures which were applied to each test.

To test for differences between personality of high

and low creative persons those subjects with the upper and lower 15 percent of scores on each criterion of creativity were selected to be compared with each other on the need scales of the EPIS. To facilitate computations, raw scores on each of the EPIS scales were converted to T scores with a mean of 50 and a standard deviation of 10. Mean scores were then computed for high and low creative groups and the differences between these means were tested for significance with a t test.

If there are differences between the personalities of the high creative subjects selected by the various criteria of creativity each group of subjects will have different needs in comparison to low creative selected by the same criterion. To provide a further comparison between the high creative subjects on each criterion it was decided to graphically represent the need profiles of those subjects selected by the Combination scores on the Unusual Uses and Consequences tests.

CHAPTER III

RESULTS

Intercorrelations of Creativity Criteria

Ratings. The first relationship to be tested in the analysis of the data was the correlation among the judges of the quality criterion. It was found that the correlations were all low but significant at the .01 level of confidence. They ranged from a low of .17 to a high of .41 with a mean correlation of .30. Although these correlations are quite low it should be noted that the restricted range of the quality rating scale would bring about a natural depression of the relationships.

Within tests. The correlations among the different scoring methods on the Unusual Uses test were all very high and significant at the .01 level (see Table I). Near perfect correlations of .97 and .98 exist, respectively, between the quantity and combination scores, and between the quality and combination scores. Correlations of this degree are usually seen as being representative of a high level of predictability between the related variables and, in this instance, could indicate that they are measuring the same thing--creativity.

TABLE I
CORRELATIONS AMONG SCORING CRITERIA
OF THE UNUSUAL USES TEST

| | 1 | 2 | 3 |
|----------------------|---|-----|-----|
| 1. Quantity score | - | .94 | .97 |
| 2. Quality score | | - | .98 |
| 3. Combination score | | | - |

Among the scoring methods on the Consequences test, the correlations were also very high and significant at the .01 level of confidence (see Table II). Once again there is a near perfect relationship between the quality score and the combination score; however, the quantity score has less of a relation to the other methods of the Consequences test than does the quantity score of the Unusual Uses test to the other methods of scoring the same test.

Between tests. When the various scoring methods are intercorrelated between the two tests of creativity, the degree of relationship drops considerably (see Table III). Since a correlation of .273 is necessary to be judged significant at the .05 level of confidence, it can be seen that the relationship between the tests of creativity is, generally, quite low, and in some instances, not significant. It is also interesting to note that both of the quantity criteria have the least degree of relationship with each other and with the other scoring methods and that the highest correlation occurs between the quality criteria.

TABLE II
CORRELATIONS AMONG SCORING CRITERIA
OF THE CONSEQUENCES TEST

| | 1 | 2 | 3 |
|----------------------|---|-----|-----|
| 1. quantity score | - | .82 | .92 |
| 2. quality score | | - | .98 |
| 3. Combination score | | | - |

TABLE III
CORRELATIONS AMONG SCORING CRITERIA BETWEEN
UNUSUAL USES AND CONSEQUENCES

| | Quantity | Quality | Combination | |
|--------------|-------------|---------|-------------|------|
| Consequences | Quantity | .267 | .306 | .289 |
| | Quality | .245 | .373 | .332 |
| | Combination | .239 | .348 | .333 |

As a further consideration of the relationships between the measures of creativity, all scoring criteria were correlated with the Total Creativity Score which was composed of the sum of the combination scores for the Unusual Uses and Consequences tests (see Table IV). As can be seen, the scoring criteria of the Unusual Uses Test correlate somewhat higher with the total score than do the criteria of the Consequences Test. Once again the lowest relationship exists between the Consequences quality score and the other data. All correlations are significant at the .01 level of confidence.

Need Profiles of High and Low Creative Subjects

Unusual Uses Test. When high and low creative subjects were selected using the highest and lowest 15 percent of the quantity scores on the Unusual Uses Test it was found that only one scale on the EPSS, that for order, differentiated between these two groups. On this scale the high creative subjects demonstrated significantly less need for order than did the low creative subjects. However, it should also be noted that this difference is significant at only the .10 level of confidence, at best a questionable basis for accepting the distinction. There was no appreciable difference between high and low creative subjects on the remaining 14 scales (see Table V).

TABLE IV
CORRELATIONS BETWEEN SCORING CRITERIA
AND TOTAL CREATIVITY SCORE

| | | Total Score |
|--------------|-------------|-------------|
| Unusual Uses | Quantity | .827 |
| | Quality | .865 |
| | Combination | .869 |
| Consequences | Quantity | .633 |
| | Quality | .735 |
| | Combination | .715 |

TABLE V

MEAN T SCORES ON THE EPPS FOR HIGH AND LOW CREATIVE
GROUPS USING UNUSUAL USES QUANTITY ORIENTATION

| Scale | High Creative | Low Creative | t |
|-----------------|------------------|-----------------|--------|
| Achievement | 47.00 | 46.00 | .268 |
| Deference | 43.00 | 49.62 | 1.485 |
| Order | 46.25 | 56.87 | 1.875# |
| Exhibition | 51.50 | 54.87 | .683 |
| Autonomy | 51.87 | 48.75 | .546 |
| Affiliation | 42.37 | 47.75 | .963 |
| Intracception | 43.87 | 52.25 | 1.361 |
| Succorance | 54.12 | 48.75 | .988 |
| Dominance | 50.62 | 53.25 | .531 |
| Abasement | 49.00 | 45.37 | .303 |
| Change | 51.62 | 46.75 | .886 |
| Endurance | 51.62 | 52.00 | .067 |
| Nurturance | 53.62 | 47.12 | 1.122 |
| Heterosexuality | 54.87 | 48.87 | .915 |
| Aggression | 54.87 | 53.00 | .412 |

#Significant at the .10 level of confidence.

Using the Unusual Uses quality scores as the criterion of high and low creativity, it was found that high creative subjects demonstrated greater needs for autonomy and succorance, and lesser needs for affiliation and change than did the low creative subjects (see Table VI). Of importance is the fact that none of these differences was found using the previous criterion of creativity and that the lower need for order, which was evidenced when using the quantity criterion, is not present under the quality condition.

High creative subjects selected by the Combination Scores on the Unusual Uses test were found to have less need for deference and order than low creative subjects selected by the same criterion (see Table VII). While the lower need for order was also found to be characteristic of high creative subjects selected by the Unusual Uses quantity criterion, the lower need for deference was not in evidence using either the quantity or quality criterion.

Consequences Test. The quantity criterion of the Consequences test found high creative subjects to have less of a need for exhibition than low creative subjects (see Table VIII). Once again, this need was not demonstrated under any of the previous criterion conditions.

TABLE VI

MEAN T SCORES ON THE EPES FOR HIGH AND LOW CREATIVE GROUPS USING UNUSUAL USES QUALITY CRITERION

| Scale | High Creative | Low Creative | t |
|-----------------|---------------|--------------|--------------------|
| Achievement | 53.37 | 45.37 | 1.618 |
| Deference | 43.37 | 48.25 | 1.070 |
| Order | 46.25 | 54.75 | 1.602 |
| Exhibition | 55.50 | 54.50 | .151 |
| Autonomy | 57.87 | 47.25 | 1.833 [#] |
| Affiliation | 39.62 | 49.37 | 2.021 [#] |
| Intracception | 50.37 | 46.50 | .733 |
| Succorance | 51.00 | 43.37 | 2.168 [#] |
| Dominance | 51.25 | 48.12 | .757 |
| Abasement | 47.12 | 52.50 | .961 |
| Change | 43.62 | 52.00 | 1.608 |
| Endurance | 47.87 | 58.12 | 2.303 [#] |
| Nurturance | 53.87 | 46.12 | 1.331 |
| Heterosexuality | 49.87 | 53.50 | .580 |
| Aggression | 57.25 | 51.50 | 1.624 |

[#]Significant at the .10 level of confidence.

[#]Significant at the .05 level of confidence.

TABLE VII

MEAN T SCORES ON THE MMPG FOR HIGH AND LOW CREATIVE
GROUPS USING UNUSUAL COMBINATION CRITERION

| Scale | High Creative | Low Creative | t |
|-----------------|------------------|-----------------|--------------------|
| Achievement | 49.62 | 48.12 | .324 |
| Deference | 43.37 | 51.25 | 1.368 ^d |
| Order | 45.37 | 56.62 | 1.998 ^d |
| Exhibition | 56.75 | 52.50 | .685 |
| Autonomy | 53.62 | 47.00 | 1.144 |
| Affiliation | 41.25 | 49.50 | 1.607 |
| Intracception | 47.62 | 49.37 | .323 |
| Succorance | 52.25 | 48.37 | .670 |
| Dominance | 49.37 | 45.37 | .854 |
| Abasement | 50.25 | 53.75 | .620 |
| Change | 45.87 | 48.50 | .527 |
| Endurance | 50.37 | 51.25 | .157 |
| Nurturance | 51.37 | 47.37 | .639 |
| Heterosexuality | 55.12 | 49.25 | .879 |
| Aggression | 55.37 | 52.75 | .641 |

^dSignificant at the .10 level of confidence.

TABLE VIII

MEAN T SCORES ON THE EPES FOR HIGH AND LOW CREATIVE
GROUPS USING CONSEQUENCES QUANTITY CRITERION

| Scale | High Creative | Low Creative | t |
|-----------------|------------------|-----------------|--------------------|
| Achievement | 53.52 | 52.00 | .375 |
| Deference | 47.25 | 39.75 | 1.424 |
| Order | 51.00 | 43.50 | 1.599 |
| Exhibition | 49.25 | 60.87 | 2.029 [#] |
| Autonomy | 53.37 | 54.50 | .250 |
| Affiliation | 43.87 | 45.50 | .434 |
| Intracception | 53.87 | 47.87 | 1.455 |
| Succorance | 50.75 | 47.50 | .579 |
| Dominance | 47.87 | 50.75 | .620 |
| Abasement | 49.75 | 50.37 | .106 |
| Change | 45.87 | 51.50 | 1.414 |
| Endurance | 47.37 | 53.75 | 1.222 |
| Nurturance | 51.25 | 43.50 | 1.378 |
| Heterosexuality | 48.12 | 55.00 | .993 |
| Aggression | 55.62 | 54.12 | .434 |

[#]Significant at the .10 level of confidence.

When high and low creative subjects are selected by the quality criterion of the Consequences test it was found that there was no accompanying personality difference on any of the EPFC scales (see Table IX).

The Combination Score on the Consequences Test selected high creative subjects with a higher need for succorance and lower needs for exhibition and nurturance than low creative subjects selected by the same criterion (see Table X). While the higher need for succorance and the lower need for exhibition were also evidenced by high creative subjects under different criterion conditions, the lower need for nurturance is specific to those high creative subjects selected by the Consequences Combination Score.

The final comparison between high and low creative groups was made by selecting subjects according to their Total Creativity Score. Using this criterion it was found that all previous need differences between these groups disappear and high creative subjects demonstrate essentially the same need patterns as low creative subjects (see Table XI).

TABLE IX

MEAN T SCORES ON THE EPFS FOR HIGH AND LOW CREATIVE
GROUPS USING CONSEQUENCES QUALITY CRITERION

| Scale | High Creative | Low Creative | t |
|-----------------|------------------|-----------------|-------|
| Achievement | 52.25 | 54.50 | .366 |
| Deference | 48.00 | 46.83 | .212 |
| Order | 52.75 | 50.67 | .318 |
| Exhibition | 48.37 | 53.83 | .596 |
| Autonomy | 52.75 | 53.17 | .068 |
| Affiliation | 45.00 | 40.00 | .942 |
| Intracception | 54.62 | 51.50 | .676 |
| Succorance | 52.37 | 48.00 | .942 |
| Dominance | 47.25 | 43.67 | .287 |
| Abasement | 51.87 | 53.17 | .196 |
| Change | 43.37 | 45.50 | .487 |
| Endurance | 45.62 | 51.67 | 1.113 |
| Nurturance | 55.25 | 47.17 | 1.311 |
| Heterosexuality | 44.50 | 50.17 | .727 |
| Aggression | 55.00 | 54.33 | .141 |

TABLE X

MEAN T SCORES ON THE EPES FOR HIGH AND LOW CREATIVE
GROUPS USING CONSEQUENCES COMBINATION CRITERION

| Scale | High Creative | Low Creative | t |
|-----------------|------------------|-----------------|--------------------|
| Achievement | 55.00 | 52.00 | .582 |
| Deference | 46.71 | 42.75 | .770 |
| Order | 52.29 | 48.12 | .716 |
| Exhibition | 45.86 | 59.52 | 1.866 [#] |
| Autonomy | 55.57 | 54.50 | .218 |
| Affiliation | 42.00 | 43.00 | .224 |
| Intraceptions | 55.29 | 49.25 | 1.329 |
| Succorance | 52.86 | 44.50 | 1.865 [#] |
| Dominance | 49.14 | 49.37 | .055 |
| Abasement | 49.57 | 52.25 | .445 |
| Change | 41.57 | 49.75 | 2.063 [#] |
| Endurance | 44.43 | 53.00 | 1.616 |
| Nurturance | 55.29 | 45.30 | 1.578 |
| Heterosexuality | 44.86 | 53.00 | 1.070 |
| Aggression | 57.71 | 54.75 | .808 |

[#]Significant at the .10 level of confidence.

TABLE XI

MEAN T SCORES ON THE EPIS FOR HIGH AND LOW CREATIVE
GROUPS USING TOTAL CREATIVITY SCORE CRITERION

| Scale | High Creative | Low Creative | t |
|-----------------|------------------|-----------------|-------|
| Achievement | 52.29 | 50.17 | .373 |
| Deference | 45.14 | 52.50 | 1.679 |
| Order | 49.43 | 53.33 | .622 |
| Exhibition | 45.00 | 54.33 | 1.199 |
| Autonomy | 53.57 | 44.50 | 1.359 |
| Affiliation | 44.14 | 44.33 | .038 |
| Intracception | 51.71 | 51.83 | .019 |
| Succorance | 54.14 | 48.17 | .900 |
| Dominance | 47.86 | 50.50 | .454 |
| Abasement | 50.71 | 50.50 | .031 |
| Change | 44.43 | 46.17 | .473 |
| Endurance | 48.00 | 52.67 | .876 |
| Nurturance | 52.57 | 43.67 | 1.411 |
| Heterosexuality | 51.57 | 47.67 | .487 |
| Aggression | 56.14 | 60.33 | .994 |

Comparisons within high and low creative groups. The variability of need profiles among high creative groups selected by different criteria and among low creative groups selected by the same criteria is illustrated by the following graphs. Figure 1 is a representation of the mean need profiles of high creative groups selected by the combination scores from both the Unusual Uses and the Consequences tests. Figure 2 represents the mean need profiles of low creative groups selected by the same two criteria. As can be seen, variability of demonstrated needs is not just characteristic of high creative subjects but of low creative subjects as well. Another important fact which is illustrated by the graphs is that neither the high nor the low creative groups deviate more than one standard deviation (10 points) from the mean T score of 50 on any of the EPIS scales. This would seem to say that neither of the groups demonstrate need profiles which would not be expected from a normal college population.

Summary of Results

The correlations among the seven criteria of creativity used in this experiment would seem to indicate (1) that there is, generally, a low relationship between the Unusual Uses and Consequences tests of creativity; and (2) that there are very high relationships among the methods

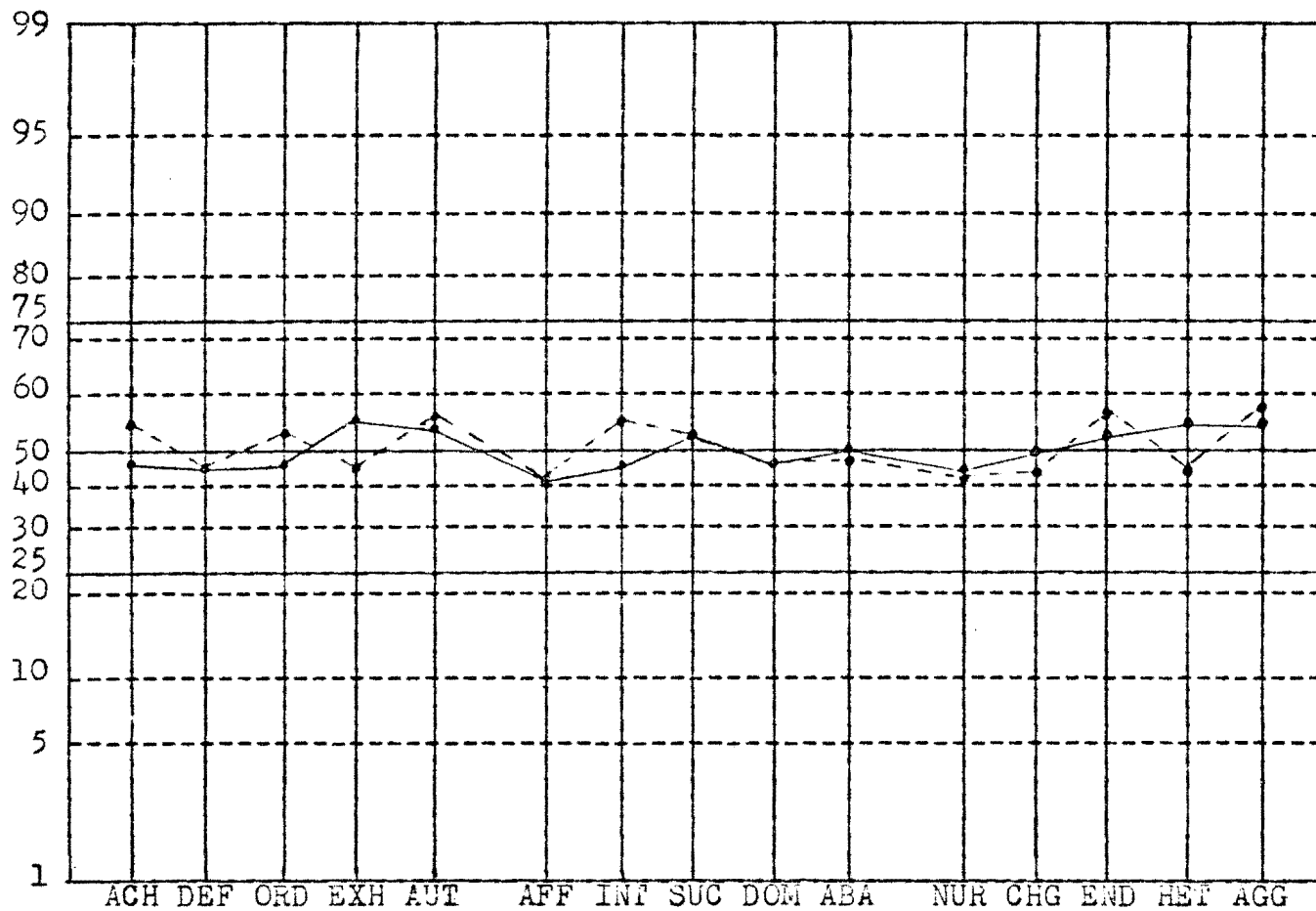


FIGURE 1

MEAN NEED PROFILES OF HIGH CREATIVE SUBJECTS SELECTED BY THE COMBINATION
 SCORES ON THE UNUSUAL USES AND CONSEQUENCES TESTS

Consequences ---

Unusual Uses —

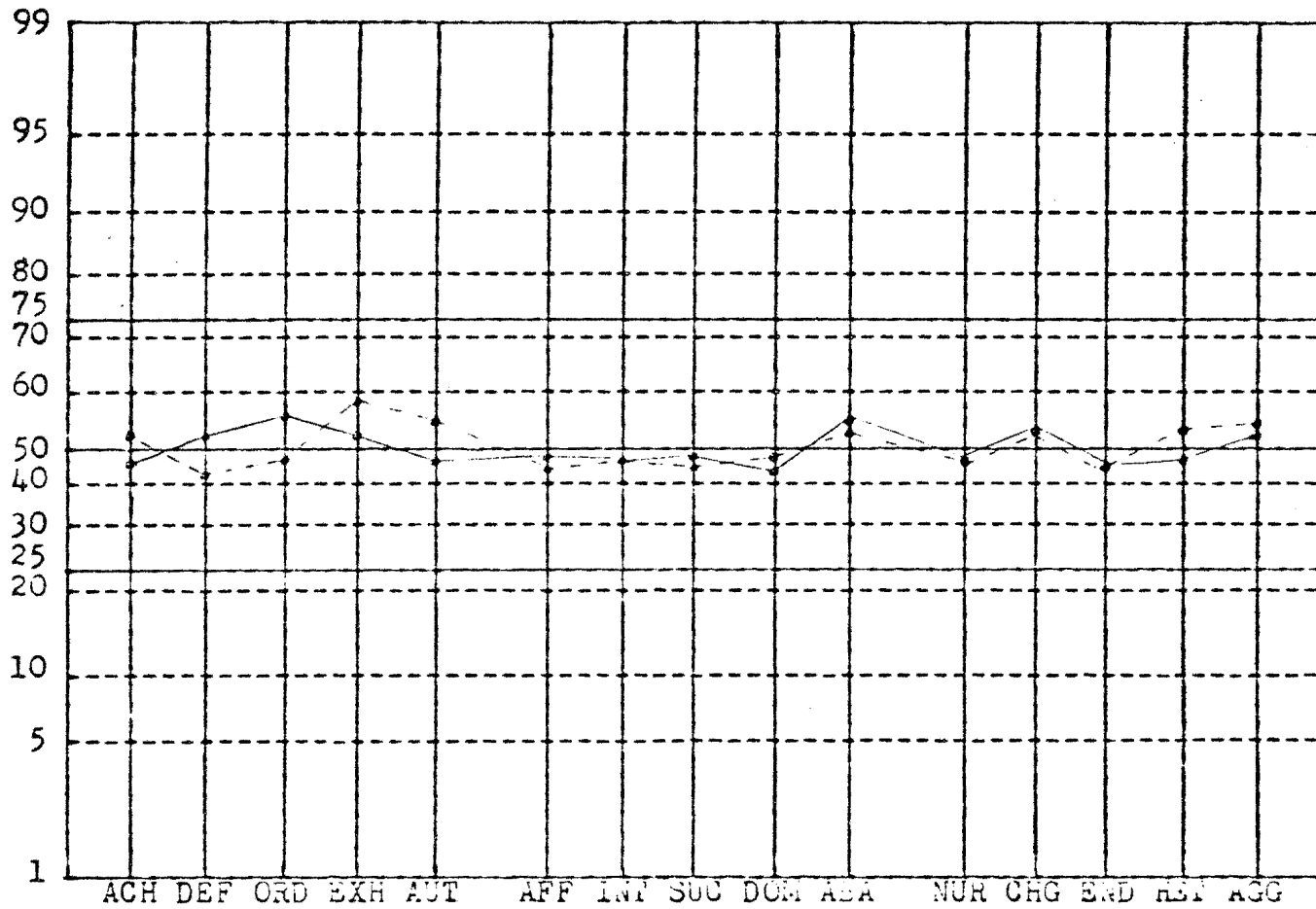


FIGURE 2

MEAN NEED PROFILES OF LOW CREATIVE SUBJECTS SELECTED BY THE COMBINATION
 SCORES ON THE UNUSUAL USES AND CONSEQUENCES TESTS

Consequences ---

Unusual Uses —

which may be employed to score these tests. When these criteria were used, separately, to select high and low creative subjects, it was found that high creative subjects demonstrated different need patterns on the EPES under different criterion conditions. Many of these differences were evident even though correlations among some of the criteria approached near-perfect proportions.

Using three methods to score the Unusual Uses Test it was found that high creative subjects, first, had a low need for order, then had high needs for autonomy and succorance and low needs for affiliation and change, and finally, had low needs for order and deference. When the same three methods were used to score the Consequences Test, high creative subjects, first, had a low need for exhibition, then did not differ in any respect from low creative subjects, and finally, had a higher need for succorance and lower needs for exhibition and nurturance. In all of the above cases, high and low needs of high creative subjects are in relation to the needs of low creative subjects selected by the same, specific, criterion of creativity.

Although the above results suggest a great deal of variability among the need profiles of highly creative subjects, the graphs, as seen in Figures 1 and 2, would seem to indicate that at least part of the variability may be accounted for by the fact that the need profiles of low

creative subjects also change with the changing of creativity criteria.

CHAPTER IV

DISCUSSION

Relationships Among Creativity Criteria

The basic assumption of this study has been that the large number of characteristics which have been reported to be part of the creative personality are, possibly, related to the varied methods by which creativity is determined. To support this assumption it was predicted that there would be low or non-significant correlations both between the two tests of creativity used and among the various methods which could be employed to score these tests. The obtained low correlations between the two creativity tests would seem to support the first half of the hypothesis, but the near-perfect correlations among the scoring methods do not confirm the second half of the assumption.

While these latter results were not those expected, they do conform to the findings and hypotheses reported by Barron (1963). In a large scale investigation of creativity, he found the relationship between the Unusual Uses and Consequences was quite low and that these tests had an even smaller relationship to other criteria of creativity. In the same article, Barron also concluded that creative people are continuously productive in the search for a solution to a problem rather than depending on one or two reasonable

propositions. Although Barron did not supply empirical evidence to support this hypothesis, the high correlations between the quality and quantity scoring criteria of this experiment would seem to lend plausibility to such an assumption.

The implications of these findings would seem to take two forms. First, the low correlations between the two tests suggest that the selection of specific creative subjects depends heavily upon the particular criterion of creativity, as contended by Thorndike (1961). The question of importance for this study then becomes: If different criteria of creativity select different creative subjects, are these subjects similar or different with regard to their personality characteristics? This will be discussed under the analysis of the GPPS data.

The second implication, based on the high correlations among the scoring criteria, is that the creative person may not be creative at all times but that he becomes so by virtue of the fact that he perseveres at a problem and eventually exhausts his supply of common, non-creative solutions. This trait may also be related to what other investigators have called, "liking for problems."

Although the plausibility of such an assumption seems reasonable there are several questions which remain to be answered: (1) Is there a difference between simple

perseverance and creative perseverance? (2) Will increased work on a problem increase creative solutions? (3) Will individuals differ with respect to the amount of increase in creative productions brought about by increased perseverance?

The answers to some of these questions seem obvious but have not been supplied by the data from this study. Because both of the creativity tests were untimed, subjects could demonstrate endurance and productivity, but the scoring methods could not distinguish between those subjects who endured and produced a large amount of low creative responses and those who persevered and produced a slightly lower number of highly creative responses. For correlational purposes the difference may prove to be small but it becomes important in the assessment of individual creativity. One possible way to answer the foregoing questions would be to compute some kind of quality per unit of quantity ratio; or, as a number of other investigators have done, ask subjects for a fixed number of responses and then score them for quality.

If it could be found that there was a relationship between gross productivity and increased creativeness, the high correlations among the scoring procedures of this study might also have the important methodological implication that creativity could be ascertained by a simple

quantity assessment. This suggestion would, however, seem to have more weight for the Unusual Uses Test than for the Consequences Test. This assumption is based on the lower qualitative-quantitative correlation for the Consequences Test and on the lower correlations between the quantitative Consequences score and the Total Creativity score. The natural implications of this may be that the type of creativity assessed by the Consequences Test may be less related to production than to the quality of the responses. In turn, these findings may indicate that production of solutions to a problem may only be related to certain creative traits, and that these traits should be further defined and explored before specific conclusions can be made.

Creative Personalities

At first glance, the results of the EPIS data appear to be inconclusive. Of 105 comparisons between high and low creative persons only two scales distinguished between these groups at the .05 level of confidence. Because this number of significant differences could be expected by chance alone, it would be difficult to conclude that there were any real personality differences between high and low creative subjects. This conclusion is also supported by the fact that neither the high nor the low creative groups

demonstrated any needs which were significantly different from what might be expected of a normal college population.

If the above considerations are assumed to be correct, it would then seem to be of prime importance to determine: (1) whether the high and low creative subjects of this experiment were truly high and low with respect to creative production; and (2) whether highly creative people really have different personalities from normal populations. The first of these considerations cannot be determined from the data of this study. Since it was decided to accept a commonly used tool for assessing creativity without providing additional validity measures it would be necessary to obtain some other empirical criterion of creativity to support or reject the assumption that the high creative subjects of this experiment were truly creative.

The second consideration, being somewhat dependent upon the first, could not be directly answered until it was evident that the high subjects actually were creative. It does, however, offer some important implications for further studies. As a result of this experiment it would seem that future investigators should give more consideration to defining the populations from which high and low creative subjects are drawn. The present data suggest the possibility that descriptions of high and low creative groups may well be descriptions of the sample population

from which they are selected. While it may be true that creative persons of a certain class (e.g., engineers) have certain personality patterns, it might also be that the majority of engineers demonstrate the same pattern and that personality variables would prove to be a poor criterion for identifying the highly creative individual.

Although the above considerations may have a great deal of weight it would also seem of some importance to discuss the possibility of personality variability among high and low creative subjects. Since only two of the EPFS scales distinguished between high and low creative subjects at the usually accepted level of confidence, it was decided to accept a slightly lower level of statistical confidence which, it was hoped, would point out a degree of variability. The .10 level of confidence was accepted with the knowledge that definite conclusions concerning a description of the creative personality could not be supported under these conditions.

When such a framework is accepted, there definitely appears to be a degree of variability among the personalities of subjects selected by the different criteria of creativity. As was pointed out in the summary of results, high creative subjects, when compared to low creative subjects selected by the same criterion, have, in one case, a low need for order; in another, high needs for autonomy

and succorance and low needs for affiliation and change.

In still another instance, high creative subjects were found to have less need for order and deference than low creative subjects. Other comparisons between high and low creative groups found the highly creative subjects to have less of a need for exhibition; to have a high need for deference and low needs for exhibition and nurturance; and in another instance, to not differ in any way from low creative subjects.

Although each of the foregoing personality traits could be placed within the structure of previous studies, it should be noted that even those characteristics which were evidenced in more than one instance were not consistently considered to be descriptive of the creative personality. While such results might be expected using criteria of creativity which had low correlations with each other, the importance of the present findings seems to lie in the fact that a great deal of the variability in descriptions of highly creative subjects occurs when these subjects are selected by separate but highly correlated scoring criteria for the same basic test.

Should the above findings be supported by further research, it is felt they would have important implications for studies in creativity. The most drastic of these would be that non-aptitude personality traits might be too

misleading to be of use in the assessment of creativity. Such an assumption would depend of course, upon numerous studies which made use of other criteria of creativity and other instruments of personality assessment. What may be found is that the LITS and the Guilford tests are poor instruments for the assessment of creativity when used in conjunction.

A more plausible implication is that there may be consistent relationships between specific criteria of creativity and specific personality characteristics. Should this prove to be the case, it would become necessary not only to compare the creative personality to the sample population from which he was chosen, as previously discussed, but also to specify the particular test and scoring method by which the creative person was judged creative. Assuming an interaction between these two variables, it may be found that descriptions of the creative personality depend highly upon both the specific personality characteristics of the sample population and upon the nature of the criterion of creativity. On a more personal level, this would also mean that one person may not be creative under all conditions but may have only certain areas of creative expression.

To evaluate the above implications it is necessary to define the limitations of the present experiment. The

major concern in this instance is with the design of the experiment. As in previous studies, it was decided to compare high and low creative subjects selected by the same criterion of creativity in order to obtain relative descriptions of the creative personality. While this design allows speculation about the variability of the creative personality under different conditions, it does not provide any statistical comparisons among just those subjects who are judged to be highly creative. Under these conditions it may be that the variability in the creative personality can be accounted for by a variability among the selected personalities of low creative subjects with whom the highly creative subjects are compared. The graphs in Figures 1 and 2 seem to indicate that the variability in descriptions of the creative person depends both upon a variability of personality characteristics among high creative and low creative subjects. While this limitation would not seem to void the results of the present study it does suggest that any conclusions concerning the variability of the creative personality should be posed as hypotheses for further research rather than as statements of confirmation.

Conclusions

The results of the present study, in the writer's judgment, support, with varying degrees of confirmation,

three conclusions. The first of these is that there are, generally, low correlations between the Unusual Uses and Consequences tests of creativity. Since the inclusion of only two tests of creativity in this experiment does not begin to exhaust the number of available tests of this type, or to adequately represent them, it would be improper to conclude that low level relationships exist among all tests of creativity. It is felt, however, that Thorndike's (1961) contention that the selection of creative subjects may depend very heavily upon the particular criterion of creativity has been at least confirmed for the Unusual Uses and Consequences tests.

The second conclusion is that there are high relationships among the different scoring criteria which can be applied to either the Unusual Uses or Consequences test in an untimed situation. This conclusion is, again, felt to be quite specific until such time as it could be demonstrated that other tests of creativity are similar to the ones used in the present study and that the scoring methods in question are applicable to the other tests.

Because of certain limitations of the present design, it is felt that specific conclusions concerning the creative personality cannot be made at this time but that certain hypotheses would seem to have weight for further research. These hypotheses would be: (1) that specific descriptions

of the creative personality are related to the specific criterion by which creativity is determined; and (2) that specific descriptions of the creative personality may also be related to the specific population from which the creative sample is selected.

Recommendations

The results of the present study suggest that similar studies be undertaken to extend the applicability of the present conclusions and to provide confirmation for those assumptions which were affected by the limitations of the present research design. The basic purpose of these studies would be similar to those of the present study with the following points of difference in procedure:

1. Repeat the present study using a greater variety of accepted tests of creativity to determine if the correlations among them are consistently low.
2. Compare personalities of high creative subjects selected by the various methods with each other rather than with low creative subjects selected by the same criteria. This should prove to be a more valid demonstration of personality variability across the tests of creativity.
3. Analyze the data from the above study with respect to different sample populations to

determine, first, whether certain creativity tests have more validity for certain populations; and second, whether the variability of personality across the tests of creativity might possibly be accounted for by the population from which the creative sample is selected.

CHAPTER V

SUMMARY

Fifty subjects were administered the Edwards Personal Preference Schedule and two tests of creativity to determine (1) the relationship between judged creativity and motivational dispositions; and (2) to investigate the degree to which the selection of creative subjects by different criteria of creativity would influence the description of the creative personality. To accomplish the foregoing, two tests of creativity (Unusual Uses and Consequences) were each scored to yield three criterion measures: (1) quality; (2) quantity; and (3) combination. Correlations were computed among the resulting criteria of creativity and t tests were conducted between the "need" profiles of high and low creative subjects selected by each of the creativity criteria. The results suggest (1) that there are low relationships between the two tests of creativity; (2) that there are high relationships among the scoring procedures which were applied to the two tests; (3) that the descriptions of the creative personality is somewhat related to the specific criterion of creativity; and (4) that high and low creative subjects may not differ significantly, with respect to personality characteristics,

from the sample population of which they are a member.

Discussion of the results was in terms of future research designs for assessing the personality of highly creative subjects and possible methodological considerations in the measurement of creativity.

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